WHAT IS CLAIMED IS;

1. A process conditions change monitoring system equipped with a monitoring unit changes in exposure conditions by use of electron beam images of resist patterns, comprising:

an image detection unit for obtaining electron beam images of said resist patterns;

a dimensional characteristic quantity detection means by which the respective dimensional characteristic quantities of a first pattern portion and a second pattern portion different from one another in the tendency of the changes in dimensional characteristic quantities, including the edge widths and/or pattern widths of the resist patterns, against changes in exposure conditions;

a memory storing the models for establishing logical linking between exposure conditions and dimensional characteristic quantities; and

a calculating unit calculating changes in exposure conditions by applying, to said models, those dimensional characteristic quantities of said first pattern portion and said second pattern portion that have been acquired by said dimensional characteristic quantity detection means.

2. The process conditions change monitoring system according to claim 1, further comprising a correcting unit correcting exposure condition according to the changes in exposure conditions that have been calculated by said calculating unit.

3. A process conditions change monitoring system equipped with a monitoring unit changes in focus value, one of exposure conditions, by use of electron beam images of resist patterns,

comprising:

an image detection unit for obtaining electron beam images of said resist patterns;

a dimensional characteristic quantity detection means by which the respective dimensional characteristic quantities of the edge widths of a first pattern portion and a second pattern portion different from one another in the tendency of the changes in the dimensional characteristic quantities of the edge widths of the resist patterns, against changes in focus value;

a memory storing the models for establishing logical linking between focus value and dimensional characteristic quantities; and

a calculating unit calculating changes in focus value by applying, to said models, those dimensional characteristic quantities of said first pattern portion and said second pattern portion that have been acquired by said dimensional characteristic quantity detection means.

4. The process conditions change monitoring system according to claim 3, wherein said exposure conditions include exposure levels, in that said models establish logical linking between exposure levels and dimensional characteristic quantities, and said calculation unit also calculates changes in exposure level by applying, to the corresponding models, those dimensional characteristic quantities, including the pattern widths of said first pattern portion and said second pattern portion that have been acquired by said detection unit.

5. The process conditions change monitoring system according

to claim 3 or 4 above, further comprising correcting the focus value according to the changes in the focus value that have been calculated by said calculating unit.

6. The process conditions change monitoring system according to claim 3 or 4 above, wherein said calculating unit calculates tolerances on focus value deviations and on exposure energy changes.

7. A process conditions change monitoring method for monitoring changes in exposure conditions by use of electron beam images of resist patterns during lithography, comprising the steps of: detecting images in order to obtain electron beam images of said resist patterns; calculating the dimensional characteristic quantities of the resist patterns, including the respective edge widths and pattern widths, from the electron beam images; calculating the respective dimensional characteristic quantities of the first pattern portion and the second pattern portion by said steps of calculating the dimensional characteristic quantities; calculating actual changes in exposure conditions through applying the corresponding characteristic quantities to the models which establish logical linking between said exposure conditions and said dimensional characteristic quantities; and; correcting the exposure conditions according to the particular calculation results.

8. A process conditions change monitoring method for monitoring changes in exposure conditions by use of electron beam images of resist patterns during lithography, comprising the steps of: detecting images in order to obtain electron

beam images of said resist patterns; calculating the dimensional characteristic quantities of the resist patterns, including the respective edge widths and pattern widths, from the electron beam images; calculating the respective dimensional characteristic quantities of the first pattern portion and the second pattern portion by said steps of calculating the dimensional characteristic quantities; calculating actual deviations from the focus value during exposure and actual changes in exposure energy level through applying the corresponding characteristic quantities to the models which establish logical linking between said exposure conditions and said dimensional characteristic quantities; and correcting the exposure conditions according to the particular calculation results.

9. The process conditions change monitoring system according to claim 7, wherein said first pattern portion is a pattern provided so that if the focus value deviates in its plus direction, the corresponding edge width will increase, and said second pattern portion is a pattern provided so that if the focus value deviates in its minus direction, the corresponding edge width will increase.

10. The process conditions change monitoring system according to Claim 7, wherein said first pattern portion is a pattern provided so that if the focus value deviates in its plus direction, the corresponding edge width will increase, and said second pattern portion is a pattern provided so that if the focus value deviates in its minus direction, the corresponding edge width will increase.